OPERATING SUMMARY

BURLINGTON-DRURY LANE

WATER POLLUTION CONTROL PLANT

1973

Ontario

MINISTRY OF THE ENVIRONMENT

MINISTER
Honourable William G. Newman

DEPUTY MINISTER
E. Biggs

ASSISTANT DEPUTY MINISTER
REGIONAL OPERATIONS
J. Barr

REGIONAL OPERATIONS DIVISION

DIRECTOR, CENTRAL REGION
P. Cockburn

MANAGER, UTILITY OPERATIONS
A. Thomas

BURLINGTON-DRURY LANE

WATER POLLUTION CONTROL PLANT

operated for

THE TOWN OF BURLINGTON

by the
MINISTRY OF THE ENVIRONMENT

1973 ANNUAL OPERATING SUMMARY

prepared by
Plant Performance Unit
TECHNICAL SERVICES BRANCH
T. Cross, Director

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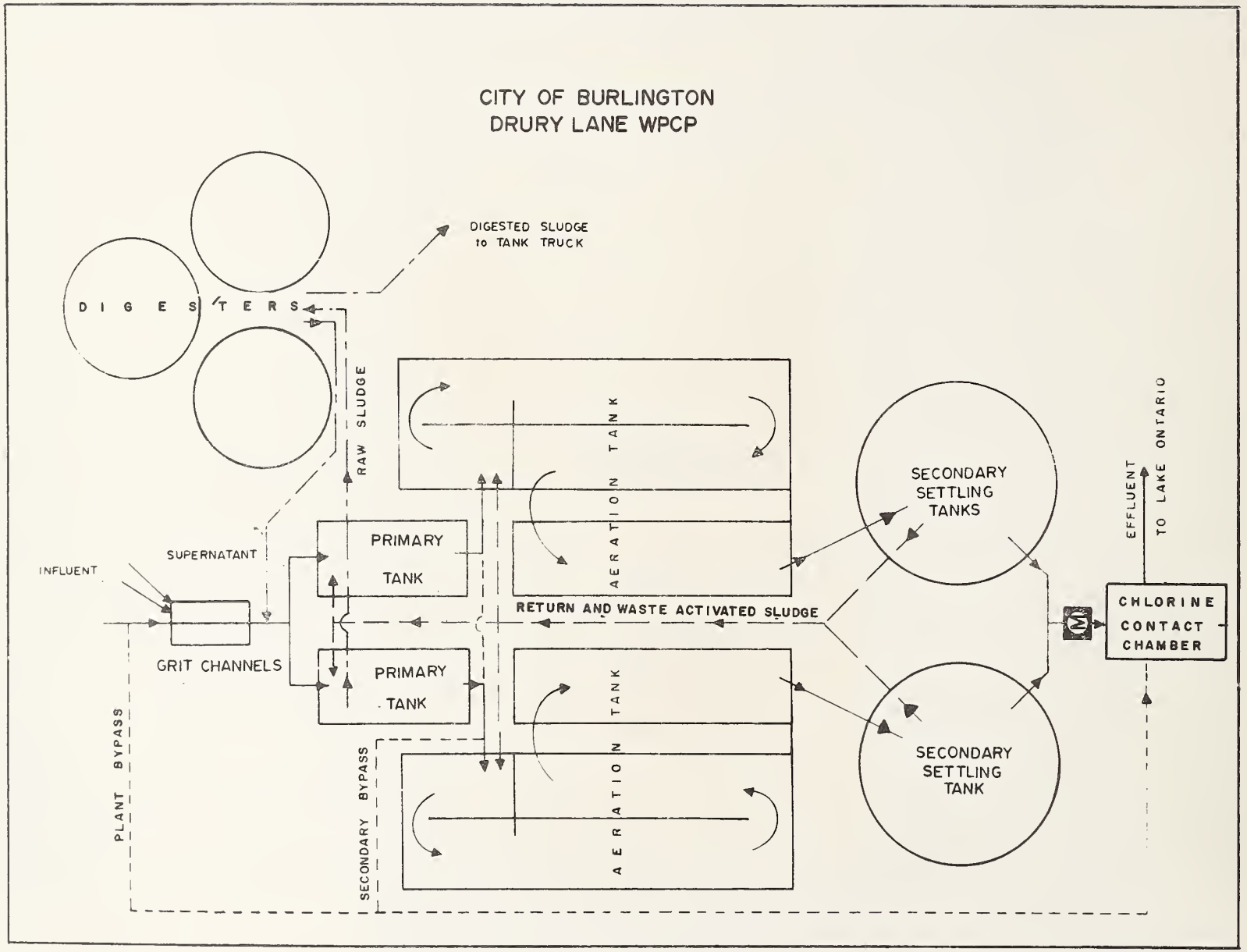

CITY OF BURLINGTON
DRURY LANE WPCP
DIGESTED SLUDGE
to TANK TRUCK
DIGESTERS
RAW SLUDGE
AERATION TANK
SECONDARY
SETTLING
TANKS
EFFLUENT
TO LAKE ONTARIO
SUPERNATANT
INFLUENT
PRIMARY
TANK
RETURN AND WASTE ACTIVATED SLUDGE
CHLORINE
CONTACT
CHAMBER
GRIT CHANNELS
PRIMARY
TANK
AERATION TANK
SECONDARY
SETTLING
TANK
PLANT BYPASS
SECONDARY BYPASS

DESIGN DATA

PROJECT City of Burlington
Drury Lane WPCP

PROJECT NO. 2-0051-60

TREATMENT Activated Sludge

DESIGN FLOW 2.5 mgd

DESIGN POPULATION 30,000

BOD - Raw Sewage 200 mg/l
- Removal 90%

SS - Raw Sewage 180 mg/l
- Removal 90%

PRIMARY TREATMENT

Screening

1" bar screens

Grit Removal

Type: Grit channels
Retention: 0.8 min

Primary Sedimentation

Type: Walker Process
Size: Two 49.3' x 18' x 12.25'
(135,700 gal)
Retention: 1.3 hr
Loading: Surface, 1400 gal/ft^2/day
Weir, 17,100 gal/ft/day

SECONDARY TREATMENT

Aeration Tanks

Type: Diffused air; triple-pass
Size: Two tanks, each with
2 passes 118' x 18' x 10.7'
1 pass 85.5' x 18' x 10.7'
(833,000 gal. total)
Retention: 8.0 hours

Air Supply

One Sutorbilt - 1500 cfm
Two Roots-Connerville - 750 cfm

Diffusers - (each tank)

1) 132 Schumacher Brandel tubes in first two passes

2) 41 Spargers on 2' centres in third pass

Secondary Sedimentation

Type: Rex Unitube Tow-Bro
Size: Two 50' dia x 10.6' swd
(260,000 gal)
Retention: 2.5 hr
Loading: Surface, 1000 gal/ft^2/day
Weir, 8500 gal/ft/day

CHLORINATION

Type: Kent

Chlorine Contact Chamber

- in outfall

OUTFALL

- to Lake Ontario

SLUDGE HANDLING

Digestion System

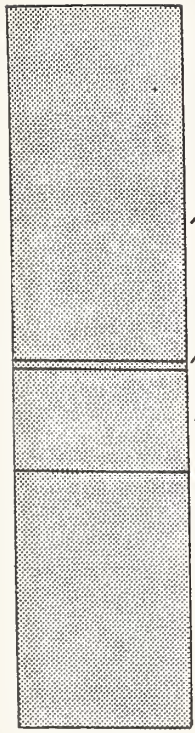
Type: Two-stage

Primary --
Size: Two 40' dia tanks (313,000 gal total)
Loading: 2.7 lb/ft^3/mo

Secondary --
Size: One 40' dia tank (143,000 gal)
Loading Total: 1.9 lb/ft^3/mo

ANNUAL COSTS

1973 OPERATING COSTS



SALARIES & WAGES	49 %
EMPLOYEE BENEFITS	NIL %
TRANSPORTATION & COMMUNICATIONS	1 %
SERVICES	14 %
SUPPLIES & EQUIPMENT	36 %
AQUISITION/CONSTRUCTION OF PHYSICAL ASSETS	NIL %
TRANSFER PAYMENTS	NIL %
OTHER PAYMENTS	NIL %

YEARLY OPERATING COSTS

YEAR	SEWAGE TREATED in million gallons	TOTAL OPERATING COSTS	UNIT COSTS $/M.G.	UNIT COSTS ¢/lb BOD
1968	568	$ 42,055	74	3
1969	595	42,152	71	4
1970		38,417		
1971	584	43,733	75	3
1972	732 *	37,791	52	3
1973	632	38,002	60	4

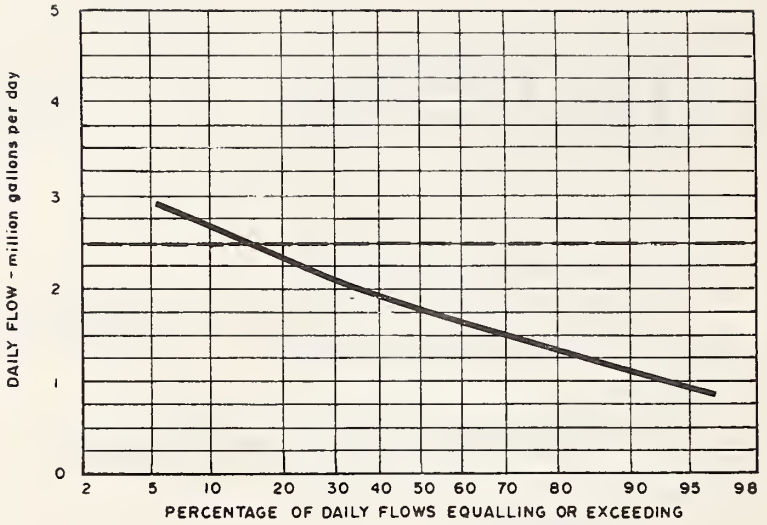
* Estimate

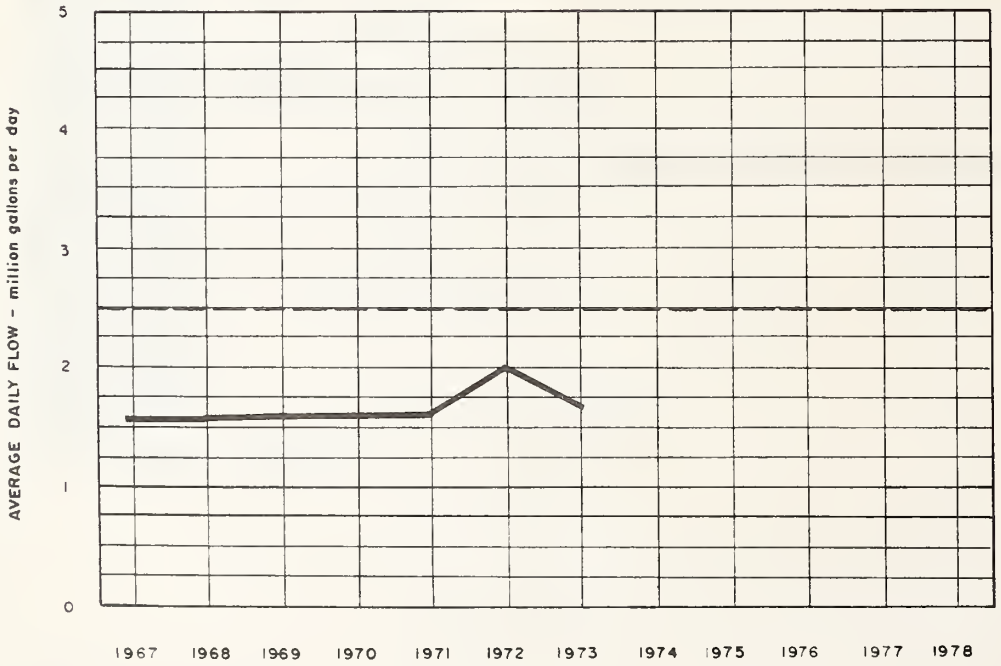
OPERATING EXPENDITURES

SALARIES AND WAGES	$18,800
EMPLOYEE BENEFITS	0
TRANSPORTATION & COMMUNICATIONS	216
SERVICES	5,371
SUPPLIES AND EQUIPMENT	13,615
ACQUISITION/CONSTRUCTION OF PHYSICAL ASSETS	0
TRANSFER PAYMENTS	0
OTHER TRANSACTIONS	0
TOTAL	$38,002

PROCESS DATA

FLOWS



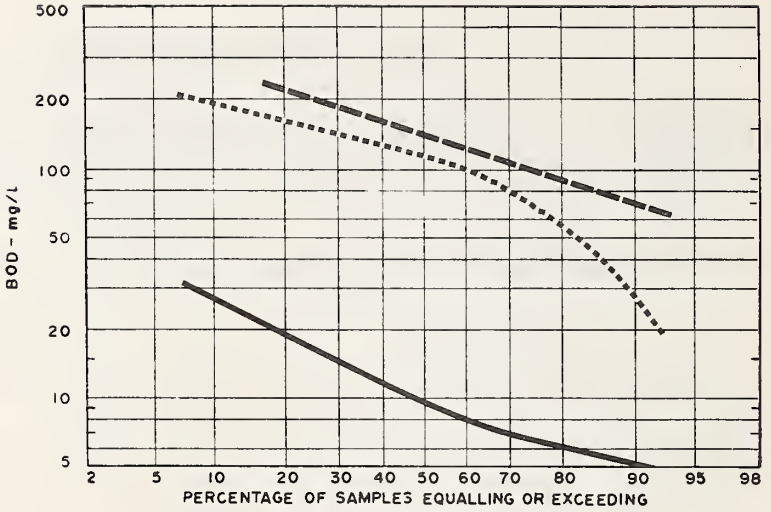


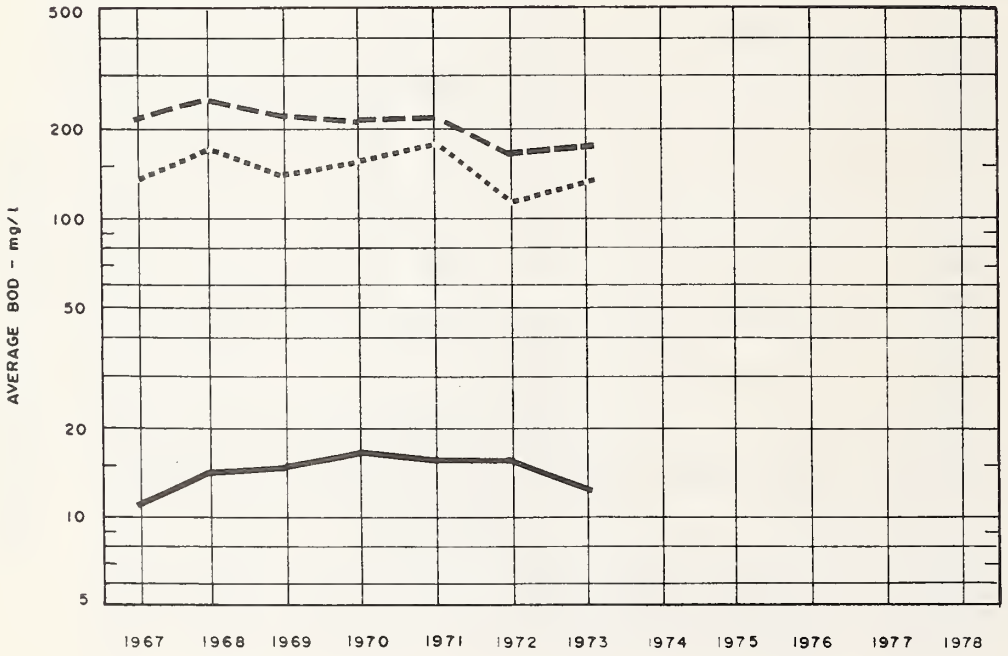
DESIGN CAPACITY _ _ _ _ _ _ _ _

PLANT PERFORMANCE

MONTH	FLOWS			BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				PHOSPHORUS	
	TOTAL FLOW	AVERAGE DAY	MAXIMUM DAY	INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT
	million gallons	mil. gal	mgd	mg/l	mg/l	%	10^3 pounds	mg/l	mg/l	%	10^3 pounds	mg/l P	mg/l P
JAN	64.2	2.1	2.8	160	20	88	90	200	20	90	120	11.0	3.8
FEB	52.8	1.9	2.7	180	5	97	92	560	5	99	290	8.9	5.1
MAR	83.4	2.7	3.4	80	7	91	61	230	9	96	180	7.2	3.0
APR	66.5	2.2	3.4	120	9	92	74	130	5	96	83	3.4	2.2
MAY	57.5	1.9	2.4	140	5	96	78	550	10	98	310	9.0	4.3
JUNE	50.1	1.7	2.0	70	7	90	32	160	30	81	65	6.8	6.1
JULY	50.2	1.6	2.1	280	28	90	130	180	10	97	85	11.0	6.1
AUG	38.8	1.3	1.5	220	7	97	82	310	10	97	120	9.2	5.3
SEPT	35.0	1.2	1.5	240	14	94	79	480	16	97	160	9.2	7.2
OCT	41.6	1.3	3.0	180	5	97	73	520	33	94	200	8.6	5.0
NOV	50.0	1.7	2.6	190	36	81	78	180	15	92	83	9.4	2.6
DEC	51.8	1.7	2.6	100	9	91	47	150	10	94	75	5.8	3.1
TOTAL	631.9	-	-	-	-	-	916	-	-	-	1771	-	-
AVG.	53.5	1.7	MAXIMUM 3.4	160	13	92	76	310	15	95	148	8.3	4.5
No. of Samples	-	-	-	12	12	-	-	26	18	-	-	12	12

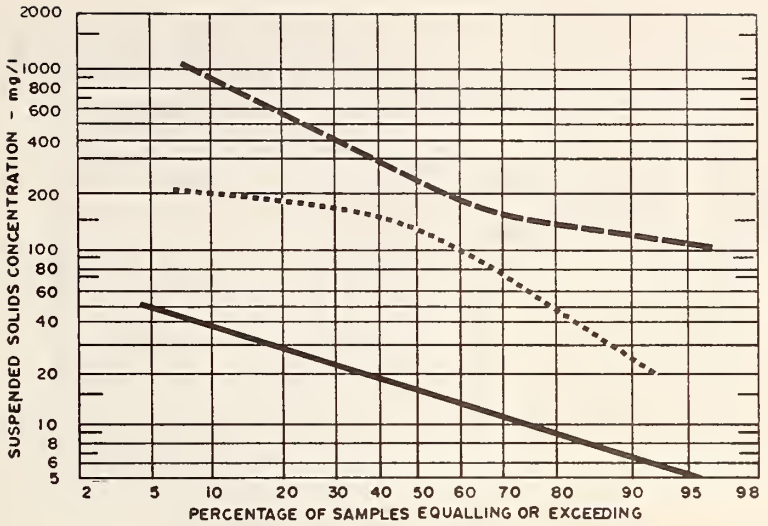
BIOCHEMICAL OXYGEN DEMAND

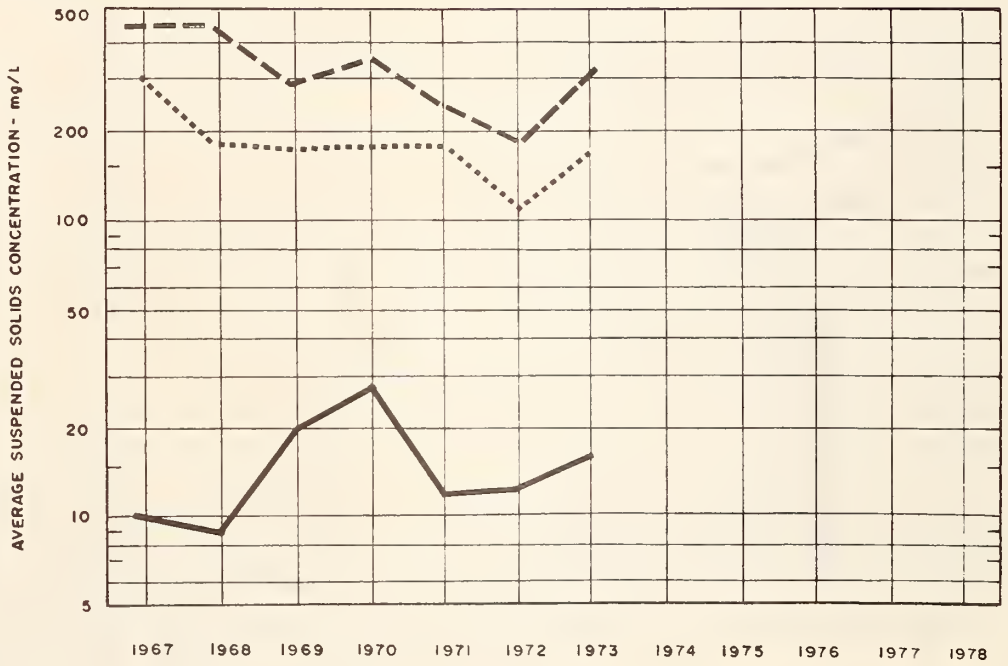




PLANT INFLUENT
PRIMARY EFFLUENT
PLANT EFFLUENT

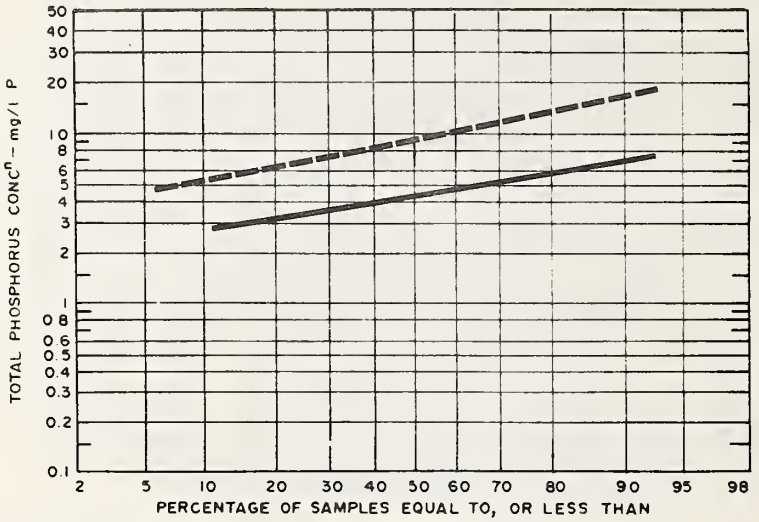
SUSPENDED SOLIDS

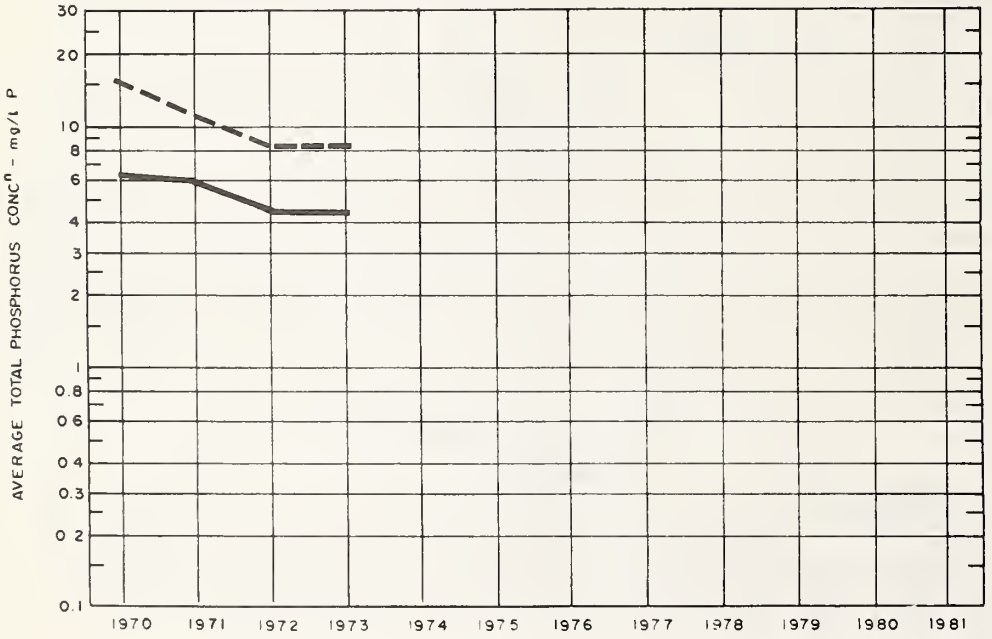




PLANT INFLUENT
PRIMARY EFFLUENT
PLANT EFFLUENT

PHOSPHORUS

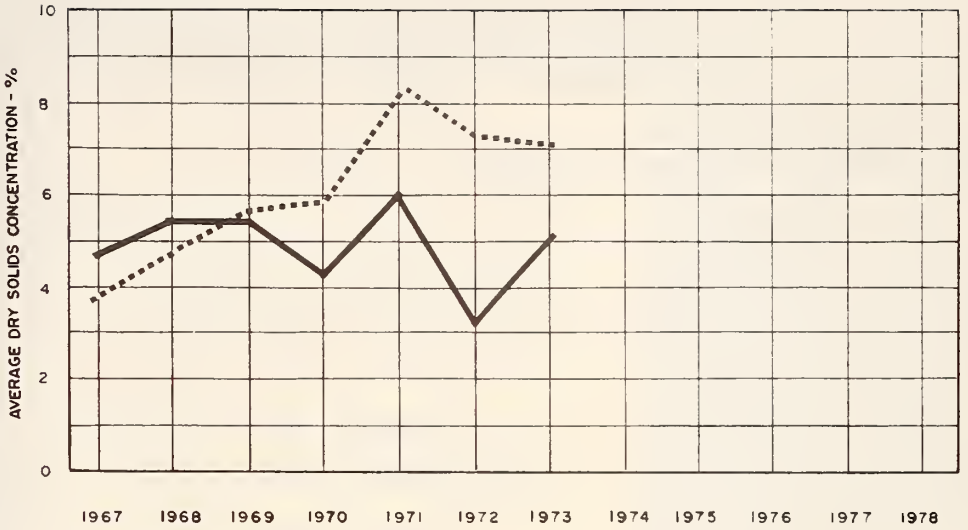


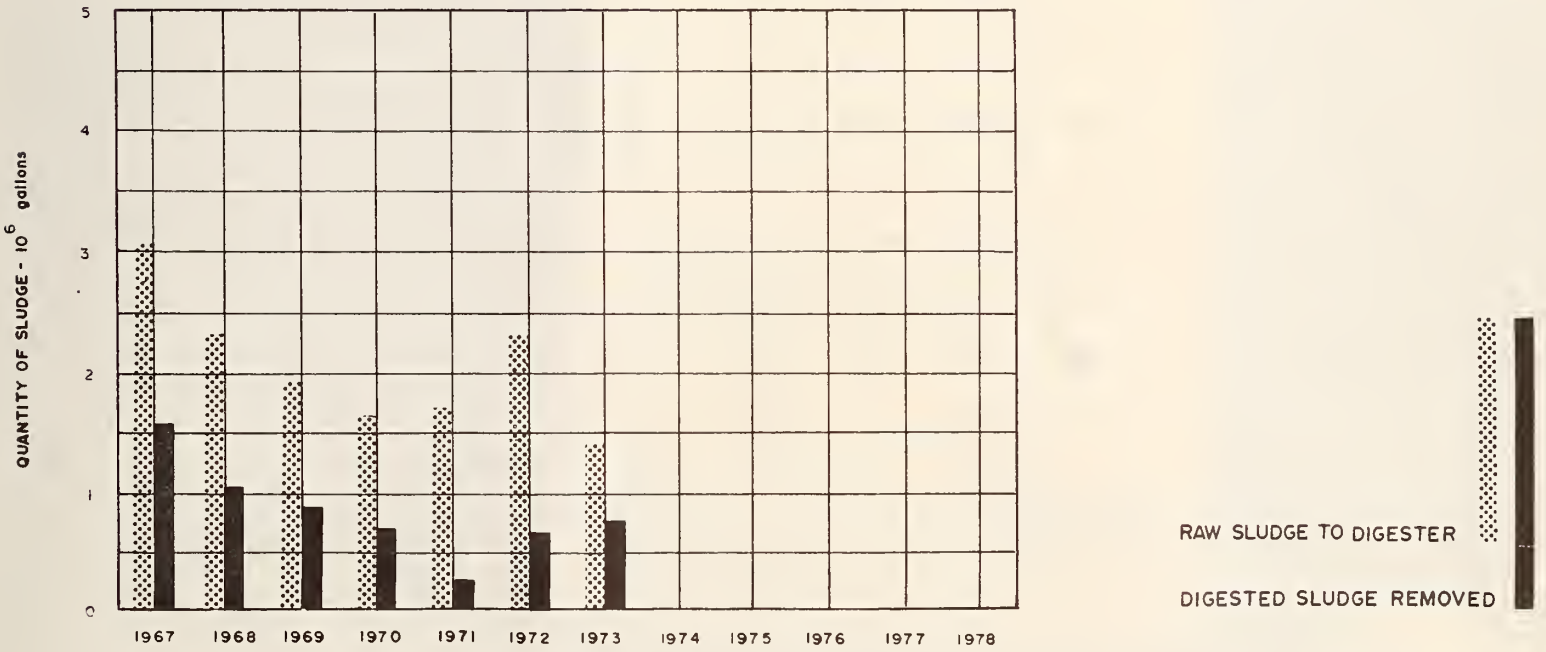


PLANT INFLUENT

PLANT EFFLUENT

DIGESTION


AVERAGE DRY SOLIDS CONCENTRATION - %
0
2
4
6
8
10
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
RAW SLUDGE
DIGESTED SLUDGE


QUANTITY OF SLUDGE - 10^6 gallons
0
1
2
3
4
5
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
RAW SLUDGE TO DIGESTER
DIGESTED SLUDGE REMOVED

TREATMENT DATA

MONTH	GRIT	CHLORINATION		PRIMARY EFFLUENT		AERATION			SLUDGE DIGESTION and DISPOSAL							
									RAW SLUDGE			DIGESTED SLUDGE			SUPER-NATANT	AMOUNT HAULED
	QUANTITY REMOVED	Cl_2 USED	AVG DOSE	BOD	SUSPENDED SOLIDS	MLSS CONC	F/M	AIR	QUANTITY	TOTAL SOLIDS	VOL. SOLIDS	QUANTITY	TOTAL SOLIDS	VOL. SOLIDS	T. S.	
	cubic feet	pounds	mg/l	mg/l	mg/l	mg/l	day^{-1}	$\frac{1000 ft^3}{lb\ BOD}$	10^5 gallons	%	%	10^5 gallons	%	%	%	cubic yards
JAN	12	0		130	170	2100	0.16	0.9	1.5			0.8				630
FEB	14	0		170	470	2200	0.19	0.7	1.2			1.0				335
MAR	39	0		90	195	2400	0.13	1.0	1.6	8.4	67	1.1	1.6	60		630
APR	45	0		100	90	2400	0.12	1.1	1.4			0.6				335
MAY	11	370	2.0	26	105	3700	0.02	5.6	1.9	13.9	84	0.4				257
JUNE	8	1330	2.6	60	85	2600	0.05	2.4	0.7	7.8	56	0.7				427
JULY	9	1660	3.3	270	120	2500	0.22	0.6	0.7	10.5	66	0.6	7.1			334
AUG	22	1400	3.6	180	88	2700	0.11	1.0	0.8	6.1	57	0.4				248
SEPT	12	990	2.8	190	373	2200	0.12	3.7	1.0	4.3	53	0.4	5.7			259
OCT	15	600	3.6	130	130	2000	0.11	1.3	0.9	4.3	53	0.4	5.7			240
NOV	51	0		110	75	2100	0.11	1.7	1.0	4.3	57	0.2				138
DEC	27	0		90	45	1900	0.10	1.6	1.1	4.7	52	0.04				21
TOTAL	265	6350	-	-	-	-	-	-	13.8	-	-	6.64	-	-	-	3854
AVG.	0.4 cu. ft/mil gal	1060	3.0	129	162	2400	0.12	1.8	1.2	7.1	61	0.6	5.0	60		